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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/427,238	10/26/1999	SHARAD KAPUR	KAPUR5-10	2915

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EXAMINER

GARCIA OTERO, EDUARDO

ART UNIT	PAPER NUMBER
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2123

DATE MAILED: 03/10/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/427,238

Applicant(s)

KAPUR ET AL.

Examiner

Eduardo Garcia-Otero

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 February 2004.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-21 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

EXAMINATION: First Action

Introduction

1. Title is: SYSTEM AND METHOD FOR DETERMINING CAPACITANCE FOR LARGE-SCALE INTEGRATED CIRCUITS
2. Applicant is: KAPUR et al.
3. US Application filed 10/26/99, no domestic or foreign priority claimed.
4. Claims 1-21 have been submitted, examined, and rejected.
5. This action is in response to RCE filed 2/6/04, accompanied with a substitute specification, and modifying all independent claims (1, 8, 15).
6. All discussion below refers to the substitute specification.

Index

7. **Belk** refers to Belk, US Patent 6,397,171 filed Apr. 1, 1999.
8. **Nabors** refers to PRECONDITIONED, ADAPTIVE, MULTIPOLE-ACCELERATED ITERATION METHODS FOR THREE-DIMENSIONAL FIRST-KIND INTEGRAL EQUATIONS OF POTENTIAL THEORY”, K. Nabors et al, Siam Journal on Scientific Computing, Vol. 15, No. 3, pp. 713-735, May 1994.
9. **Edgecombe** refers to Edgecombe et al., US Patent 6,345,235 filed
10. **Dufour** refers to Dufour, US Patent 6,351,572.
11. **“Large-Scale Capacitance Calculation”**, by Sharad Kapur and David E. Long, 2000 ACM.

Applicant Remarks

12. In view of Applicant’s persuasive assertions and amendments, all prior rejections are withdrawn.
13. Some new 35 USC 101 rejections, and new 35 USC 112 rejections are given below.
14. All of these rejections may be cured by relatively minor amendments, and then all the claims may be in condition for allowance.

Specification-objections-informalities

15. The Specification is objected to because of the following informalities. Appropriate correction is required.
16. At page 7 paragraph 19, FIG 2B is referenced, but FIG 2 is not referenced.

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17. The drawings contain a figure “2” drawing, and a separate figure “2B” drawing. The present figure “2” drawing should be amended to read “2A”, and the specification should reference said figure “2A”.

35 USC § 101-statutory subject matter

18. 35 U.S.C. 101 reads as follows: Whoever invents or discovers any new and useful **process, machine, manufacture, or composition of matter**, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
19. **Claims 1-7 and 15-21 are rejected under 35 U.S.C. 101** because the claimed invention is directed to non-statutory subject matter.
20. Independent claims 1 and 15 state “a system... comprising... generator”. Note that the statutory categories are limited, and do not include “system”. It appears that said “generator” is a software module.
21. Note that “software” is generally not patentable as such, but must be claimed as process steps, or as machine, or as manufacture. For example, software may be claimed as machine or [article of] manufacture by stating “a computer readable media containing instructions, which when executed, cause the following steps to be performed”.
22. Also see MPEP 2106 regarding computer related inventions.
23. Said independent claim “systems” are interpreted as “machines” or articles of “manufacture”, which contain computer readable instructions, which when executed perform said generations and formulations.
24. Claims 2-7 and 16-21 depend from claims 1 and 15 respectively, and thus are rejected for the same reasons.

35 USC § 112-Second Paragraph-indefinite claims

25. The following is a quotation of the second paragraph of 35 U.S.C. 112: The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
26. **Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite** for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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27. In claim 1, third limitation states “wherein said charge variation function is projected on said representative conductive geometry to provide said representation...”. The term “said representation” appears to refer to the term “representation of charge distribution” from the preamble, and not to the term “representative conductive geometry” in the third limitation. Please amend to clarify.
28. Also in claim 1, third limitation further states “to reduce a complexity thereof”, apparently referring to reducing the complexity of the integral equations. Please amend to clarify.
29. Claims 8, and 15 are rejected for the same reasons.
30. All other claims are dependent, and are rejected for the same reasons.

Claim Interpretation

31. The term “multidimensional charge variation function that is **not directly dependent** on a conductive geometry of said structure” is interpreted in view of the specification paragraph 27 which states “the net C3 is located far enough away that the exact geometry of the net C3 is not critical. Therefore, were the net C3 to be replaced with a simpler geometric description, the number of unknowns could be reduced”. See FIG 1. Also see Figure 1 “A simple example” in page 744 of “Large-Scale Capacitance Calculation”, which graphically displays the “simpler geometric description” of net C3, as described and enabled in the specification paragraph 27.
32. In other words, the term “not directly dependent on a conductive geometry of said structure” is interpreted, as “dependent on a simplified conductive geometry, where the geometry of the distant conductors is simplified”
33. The term “**integral equation formulation**” is broadly interpreted to mean any description of capacitance which includes or is derived from at least one integral equation.
34. The preamble term “**system**” in claims 1 and 15 is interpreted as “machine” per statutory categories of 35 USC 101.

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Additional Cited Prior Art

35. The following US patents or publications are hereby cited as prior art, but have not been used for rejection. Applicant should review these carefully before responding to this office action.
36. "Large-Scale Capacitance Calculation", by Sharad Kapur and David E. Long, 2000 ACM, provides additional discussion of the present claimed invention, and provides clear figures displaying the discussion in the present specification at paragraph 27.

Conclusions and Suggestions

37. All prior rejections and objections are withdrawn, some new rejections and objections are made.
38. Claims 1-7 and 15-21 are rejected under 35 USC 101.
39. Claims 1-21 are rejected under 35 USC 112.
40. The specification is objected to regarding reference to the figures.
41. To make the present application more clear, the Examiner suggests (but does not require) that the present FIG 1 be amended into two figures: FIG 1A and FIG 1B similar to (or identical to) the Figure 1(a) and Figure 1(b) in the paper "Large-Scale Capacitance Calculation". Said revised figures would be referenced in the Examiner's Reasons for Allowance, and suggested FIG 1B would be placed in the first page of the issued patent. If suggested FIG 1B is added, then the specification should be amended to reference it.
- 42. In summary, all present claims appear to contain patentable material, and there are no rejections based upon prior art.**


Communication

43. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eduardo Garcia-Otero whose telephone number is 703-305-0857. The examiner can normally be reached on Tuesday through Friday from 9:00 AM to 8:00 PM. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kevin Teska, can be reached at (703) 305-9704. The fax phone number for this group is 703-872-9306. Any inquiry of a

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general nature or relating to the status of this application or proceeding should be directed to the group receptionist, whose telephone number is (703) 305-3900.

* * * *



KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER